Student Technology Fee Income - FY15

2014-2015 Computer Fee Income Summary

		FY14 (Summer & Fall 2013; Spring 2014)	FY15 (Summer & Fall 2014; Spring 2015)	4/8/2015 Computer Fees Free Balance**
Additional Fees*				
Engineering	202-02-67-00-0001 & 00-0002	1,825,278	1,775,581	
Computer Science	202-21-06-00-0050	110,873	117,559	
Business	202-08-40	89,899	85,989	
Subtotal - Units		**2,026,050**	**1,979,129**	**-**
Units				
Central Pool/CAC Initiatives	202-17-10	1,452,912	1,371,450	2,117,322
IT Services	202-26-36	1,051,054	992,086	282,656
Library	202-09-10	338,959	320,202	248,557
Subtotal - Units		**2,842,924**	**2,683,737**	**2,648,535**
Colleges:				
Agriculture & Life Sciences	201-01-05-00-0100	558,856	418,411	891,384
Business	202-08-40	431,500	352,041	240,779
Design	202-07-05	269,980	199,048	95,444
Engineering	202-02-67-00-0002	902,010	734,486	1,921,956
Human Sciences	202-10-15	646,750	504,850	700,912
Liberal Arts & Sciences	202-04-36	1,355,707	934,991	1,368,799
Veterinary Medicine	202-05-11	98,567	71,521	(7,053)
Subtotal - Colleges		**4,263,370**	**3,215,348**	**5,212,222**
College Pool (pending SCH distribution)	202-17-11	390,186	826,697	1,216,883
Total Fees Paid		**9,522,530**	**8,704,911**	**9,077,640**

*Computer Fee balance for additional fees is incorporated with standard feel in "Colleges" list.
**Includes encumbrances.

2013-2014 Technology Fees	Fee/Semester
Standard Fee	$115.00
Graduate Students Standard Fee	$92.00
Computer Science	$223.00
Engineering	$223.00
Business	$135.00
Graduate Students Business Fee	$112.00

Central Pool Budget - FY15
4/8/2015

	FY14 Budgeted/Carry Forward	FY15 Transfers or Expenditures through 4/8/15	FY15 Current Balance
FY14 Balance Forward/FY15 income^	1,300,937	-71,675	1,229,261
Enterprise Initiatives:			
FY14 and FY15 Wireless Initiative (FY14 alloc to date)*	2,222,526	1,468,656	753,870
Subtotal - Enterprise Initiatives:	2,222,526	1,468,656	753,870
General Commitments:			
Office Support (Miscellaneous)	5,000	472	4,528
Student Network Access Program	55,000	11,671	43,330
Student Printing Subsidy	175,000	160,613	14,387
PaperCut Support	25,000	6,532	18,468
Administrative salary support (Swanson)	4,700	7,096	-2,396
Subtotal - General Commitments:	264,700	186,383	78,317
CAC Initiatives (current):			
FY11 - Lohrbach-Wireless Exp	51,281	2,342	48,939
FY14 - Reiman Gardens-McLaughlin	38,066	30,567	7,499
FY14 - Virtual Surgery-Peterson	9,058	4,709	4,350
Subtotal - CAC Initiatives (current):	98,405	37,618	60,787
Computer Fee Print Income - Pass Through	21,077	-16,797	4,280
FY14 Balance	**3,886,568**	**1,764,332**	**2,122,235**
Available for commitment*:			***1,229,261***

APPENDIX A

Request for advance approval of unusual* expenses

[*Categories of unusual expenses are listed in paragraph 2, Section III of the "Guidelines for Appropriate Expenditure of Income from the Student Technology Fee."]

Department: Engineering Technology Services

Building/room location: Hoover, Rooms 2255, 2260, 2264, & 2268

Description: Remodel of college computer labs with new furniture and infrastructure to support increased student count.

Total Project Cost: $178,000 - $205,000

Category of unusual expense(s) within the project (see http://www.cio.iastate.edu/committees/cac/policies/expenditures_2011-2012.pdf):

Furniture and renovation

Costs associated with these unusual expenses: $178,000 - $205,000

Date(s) of proposed expense: Spring 2015

Justification*: College computer labs have not been modified since the building's opening nearly 10 years ago. This remodel would expand available computers, update electric and network infrastructure to handle the load, and create a more engaging environment for students to work.

These labs are used by all engineering students for their coursework, available 107 hours per week. We frequently see students waiting to use computers in these labs. This update will add additional seats, addressing throughput, to more efficiently and effectively serve our growing enrollment in the college of engineering.

***(Please attach PIQ of employee if requesting greater than 50% of base salary support from CAC.)**

Requested by: __Ron Cox_____

College approval: _____ 3-30-15

Cost Range Estimate

PREPARED BY: DESIGN SERVICES, FACILITIES PLANNING AND MANAGEMENT, IOWA STATE UNIVERSITY

Project Number: **PR018694** Date of Estimate: **03/25/15**
Building: **Hoover Hall - Furniture in 2260 and Remodeling all rooms.**
Project description: **Room 2255, 2260, 2264 & 2268 remodeling .**
Project square footage: **4210**

Project Scope Description

This project will remodel the existing computer lab 2260 and three classrooms 2255, 2264 & 2268.
Scope of work: **Rooms 2255, 2264 and 2268** - Add new chairs. Paint walls. Install new carpet and wall base. Install new light fixture above white boards. Add Data points in ceiling. **Room 2260** - Install new desks, chairs, monitor arms and CPU slings. Paint walls. Install new carpet and wall base.

Construction	
Carpet & Base	$22,000
Paint walls	$4,500
Electrical Lights Data	$15,000
Furniture	
New tables and chairs	$100,500
Coordination Storage 2%	$2,010
Design	
8% Design Services	$11,400
Project Management	
5% Project and Construction Management	$7,800
Project Contingency	
10% of project estimate	$14,200

PROJECT COST RANGE: $178,000 to $205,000

Cost per Square foot: $42.28 to $48.69

This is only an opinion of probable cost. Please let us know if you need a more detailed estimate. A schematic design with scope of work will be prepared on an hourly basis and charged to the departmental account submitted with your request.

Assumptions:

Please note that there are many circumstances within an existing facility that can significantly impact this cost range estimate. It is important to understand that this estimate was made on our knowledge of the facility and without extensive or exhaustive review to either the site or related documents to determine the condition or capacity to existing conditions of systems. The cost range assumes the following:

* The mechanical and electrical systems that currently serve the area have sufficient capacity to serve the remodeled space.
* There may be undiscovered hazardous materials present that will require abatement or special treatment.
* There are no concealed conditions that would require unusual or extensive measures to correct or modify to accommodate the work requested.
* The level and quality of finishes in the remodeled area will be similar to adjacent areas and other spaces in the building.

Additional details that you have requested are as follows:

- ~100 chairs amongst 4 computer labs (1 open, 3 classroom/open)
- ~30 tables for open lab renovation
- Renovation of open lab will add ~8-10 additional seats.

Given the number of hours these labs are open, the student impact is quite dramatic.

Yes, new computers will be purchased. We plan to use student technology funds for this cost too.

APPENDIX A

Request for advance approval of unusual* expenses

[*Categories of unusual expenses are listed in paragraph 2, Section III of the "Guidelines for Appropriate Expenditure of Income from the Student Technology Fee."]

Department: IMSE And Mechanical Engineering

Building/room location: Rm 36 Black Engineering

Description: Purchase 2 Coordinate Measuring Machines for use in teaching laboratory. These computer controlled devices are critical to the education of 2500 undergrads in ME and IMSE.

Total Project Cost: 70,980 from ~~CAC~~ with IMSE and M.E. contributing 20K a piece to bring the total to 110,980. the College of Engineering Dean's Office

Category of unusual expense(s) within the project (see http://www.cio.iastate.edu/committees/cac/policies/expenditures_2011-2012.pdf):

This would be a hardware and software purchase. The CMM machines are controlled by software provided at additional costs from the supplier.

Costs associated with these unusual expenses:

Date(s) of proposed expense: Immediately

Justification*: The current CMM machines are outdated and no longer supported by the company that manufactured them. These machines are critical to instruction and are technology driven in application.

Requested by: Nate Jensen, Mechanical Engineering _____

Requested by: Jeff Eichorn for IMSE _____

College approval: _____ 4-16-15

PROPOSAL FOR

Iowa State University

4.5.4 SF

HEXAGON
METROLOGY

27-May-2014

Wyman Martinek
Iowa State University
1043 Black Engineering Bldg
Ames IA, 50011

PROPOSAL NO.050614_2

Dear Wyman :

Thank you for the opportunity to propose the 454SF to you. We are confident it will meet your application requirements and provide years of reliable service.

Our commitment to producing accurate and reliable CMMs is recognized around the world. Our installed base encompasses millions of tools and machines, and tens of thousands of seats of software. Hexagon Metrology offers products and services for metrology applications in over 200 industry segments. We support our customers with actionable measurement information throughout the complete life cycle of their products – from development and design to production, assembly and final inspection. We empower our customers with control of their manufacturing processes, enhance the quality of their products and increase efficiencies in their manufacturing plants anywhere in the world.

We hope the following proposal will prove favorable to you. It will remain valid for 60 days. Hexagon Metrology, Inc. standard terms and conditions will apply.

We offer comprehensive support to our customers. Please visit the following sites for more information:

Online Support

HexagonMetrologyU

Online Store

For any additional question you might have, please do not hesitate to contact me or our office anytime. We look forward to being your partner in all your measurement needs.

Sincerely,

Troy Anderson
Productivity Quality, Inc.
763-249-8137
troy.anderson@pqi.net

I. SYSTEM SUMMARY

MACHINE

The 4.5.4 SF CMM offers a robust dimensional inspection capability in a fully automated and economical CMM designed and built to excel in harsh manufacturing environments, shoulder-to-shoulder with machine tools. Linear bearings and heavy-duty components provide you with a highly reliable, low maintenance measurement solution.

- 4.5.4 SF Metrology Frame
- UMP-360 Controller
- Next Jog Box
- TESASTAR Touch Trigger Manual Swivel Integral Probe Head and Probe
- TESASTAR Stylus Kit #103
- LED Workspace Illumination
- Probe Qualification Sphere and Clamp Kit
- Demonstration Block

COMPUTER & SOFTWARE SYSTEM

The computer and software offering have been optimized for walk up and me uch Interface operation. Computer and software upgrades are available for part programming environments.

- Dell OptiPlex 7010 DT or current model
- 15” LCD Touch Screen
- PC-DMIS PRO

SERVICE & SUPPORT

- Installation[1]
- Onsite Performance Verification[2]
- Online Help Files, PC-DMIS
- System User’s Manual on CD
- PC-DMIS PRO Training (one student for four days at Hexagon Metrology)[3]
- One Year System Warranty with Telephone Applications Support[4]

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[1] *Customer should uncrate and move the CMM to the intended installation location at least 24 hours prior to arrival of the Hexagon Metrology service technician in order for the machine to reach ambient temperature. If the customer requires, Hexagon Metrology can provide this service for an additional fee (see quotation for details).*

[2] *Upon completion of the measuring system installation, a technician will verify performance to either ISO or ASME B89 standards.*

[3] *Software training credits are valid for one year from the date of shipment and do not include travel and living expenses of attendees.*

[4] *Successful completion of the basic PC-DMIS software training is prerequisite for telephone applications support.*

II. TERMS OF QUOTATION

IOWA STATE SYSTEM SUMMARY

BASIC SYSTEM PRICE	**$36,900.00**
Upgrade from PC-DMIS PRO to PC-DMIS CAD++ and Autopath	**$13,000.00**
25 licenses of PCDMIS CAD++ Offline ($12,900.00 ea)	**$322,500.00**
PC-DMIS Online Programming Station Option 2:	**$1,290.00**
Total List Price	**$373,690.00**
Educational Discount	**<$320,000.00>**
Sell Price	**$53,690.00**

ADDITIONAL TRAINING CREDITS

***PC-DMIS CAD Level 1 DCC Software Training (5 Days)**	**$1,800.00**

Purchase Orders made to:	Hexagon Metrology, Inc. 250 Circuit Drive North Kingstown, RI 02852
Terms & Conditions:	Hexagon Metrology, Inc. Standard Terms & Conditions Apply; any sale is expressly conditioned on acceptance of such terms. The Standard Terms & Conditions and Third Party Software Terms & Conditions, are viewable at: www.hexagonmetrology.us/terms
CAGE CODE:	1WUK4
Submit PO To:	Hexagon Metrology, Inc. Email: cos.hmi.us@HexagonMetrology.com FAX: (401) 886- 2768
Tax Exemption:	If applicable, a Tax Exemption Certificate must be submitted to Hexagon Metrology, Inc. with the Purchase Order
Delivery:	4 to 6 weeks for standard configurations, plus time for shipping, A.R.O., to be confirmed at the time of order placement
Shipping Terms:	Prices quoted are F.C.A. (“free carrier at”) North Kingstown, RI in accordance with the International Chamber of Commerce INCO Terms 2010.
Title Transfer:	Title transfers to Buyer upon shipment from factory of origin including all risks and rewards of ownership
Quotation Validity:	60 Days
Remit Payment Only To:	Hexagon Metrology, Inc. Lockbox No. 771742 1742 Solutions Center Chicago, IL 60677-1007

III. CUSTOMER QUOTATION DETAILS

INCLUDED IN PACKAGE

4.5.4 SF
The 4.5.4 SF is like a machine tool for quality control—no other CMM performs like it in tough shop-floor conditions. The SF series draws its design inspiration from over fifteen years of shop floor machine production experience and thousands of units in the field worldwide. It is designed from the ground up to surpass the demanding requirements of shop floor users. This rugged CMM excels in the harsh environment of machine shops and manufacturing cells with advanced thermal compensation, covered ways, built-in vibration resistance and shop-hardened design. It's flexible — using standard 110/220 volt outlets with no need for shop air. The compact footprint and roll-around stand, specifically designed to fit through a standard door, lets users easily move the SF series anywhere in the shop where precise dimensional inspection is required. It's economical to own and operate, with low up-front cost and simple maintenance. Using the touch screen interface and PC-DMIS STI+, operators can run inspection programs on the shop floor with little training. Gaining immediate insight into quality control helps you react quickly to process variations, reducing scrap and increasing productivity.

UMP-360 Control System
Controller electronics supports touch-trigger capability and temperature compensation models on Global Classic systems. The UMP-360 is also compatible with the jog box which comes standard with all Global CMMs. The UMP-360 comes in a compact IP-32 rated electrical cabinet that is mounted to the back of the machine.

Next JogBox (NJB)
Our new jogbox with ergonomic design and improved durability. NJB system comes packaged with a cradle and cradle holder to allow for a safe placement when not in use.

TESASTAR
The TESASTAR is a manual swiveling unit with the probe and head integrated into one compact unit. The TESASTAR has an M3 thread stylus interface and articulated probe head which can be manually rotated to an infinite number of non-repeatable angular positions. The built-in compact touch-trigger probe features a user adjustable trigger force.

TESASTAR Stylus Kit #103
M3 threaded stylus kit includes:

(Qty. 1) Mounted probe Ø 6.35 mm
(Qty. 1) Ball stylus ∅ 2 mm x L 21 mm, Steel
(Qty. 1) Ball stylus ∅ 3 mm x L 21 mm, Steel
(Qty. 1) Ball stylus ∅ 4 mm x L 21 mm, Steel
(Qty. 1) Extension L 10 mm, Steel
(Qty. 1) Extension L 20 mm, Steel
(Qty. 1) 5-way stylus center, Steel

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INCLUDED IN PACKAGE

PC-DMIS PRO Software
This software option provides a user friendly interface, reporting tools, and includes the full library of GD&T functions for the comprehensive inspection of manufactured parts. Calibration of probe tools is made easy through a graphical utility that enables the user to build assemblies exactly as they appear and calibrate them automatically. Part alignments are also made easy through step-by-step routines that guide the user with graphics illustrating when a part becomes fully constrained. Its unique and intuitive graphical user interface makes it suitable for operators of all skill levels. PC-DMIS PRO includes a four day training course at a Hexagon Metrology Precision Center for one person.

Measurement Volume Lighting - LED Lighting
Sometimes measuring tasks require a brightly illuminated work area. Rather than improvise fixed or handheld solutions, this feature provides an engineered solution to illuminate the 4.5.4 SF measuring volume with bright LED lights that turn on automatically when the CMM is powered on

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Standard Steel Qualification Sphere

Table Clamp Kit
This convenient kit consists of the following items:

(Qty. 24) M8 studs
(Qty. 8) Flanged nuts
(Qty. 8) Coupling nuts
(Qty. 6) Step blocks
(Qty. 6) Serrated end clamps
(Qty. 1) Kit holder

Computer
Dell Optiplex 7010 Desktop or current model

PROCESSOR:	INTEL CORE i5 3225 Processor (Dual Core 3.3GHz, 3MB)
RAM:	4GB, Non-ECC, 1600MHz DDR3
HD:	500GB 2.5, SATA 3.0Gb/s and 16MB Data Burst Cache
DVD:	16X DVD+/-RW SATA, Data Only
GRAPHICS:	Intel Integrated Graphics
MOUSE:	Dell MS111 USB Optical Mouse
OS:	Windows 7 Professional (64Bit OS)
LAN:	1 Onboard Ethernet Adapter
PORTS:	1 Serial Ports

Monitor
15” LCD Touchscreen (1024x768) or current model

COMPUTER UPGRADES INCLUDED IN PACKAGE

Upgrade Option 2:

PC-DMIS Online Programming Station Option 2: **$1,290**
Replaces the touch screen monitor and small form factor computer with a workstation desk, computer upgrade, and large screen LCD monitor. This option is ideal for customers where shop floor space is not too limited and the 4.5.4 SF will be used for online part program development.

Computer
Dell Precision T3600 or current model

PROCESSOR:	Four CORE XEON E5-1607, 3.0GHz
RAM:	8GB DDR3 UDIMM 1600,NECC,4x2GB
HD:	500GB,SATA,3.5",7200,NCQ,16M
DVD:	16X DVD+/-RW and 8X DVD, Data Only
GRAPHICS:	1GB nVIDIA Quadro 600, Dual Monitor, 1DP and 1DVI
MOUSE:	Dell MS111 USB Optical Mouse
OS:	Windows 7 Professional, 64-bit
LAN:	2 Gigabit Ethernet Ports
PORTS:	1 Serial Port

Monitor
Dell 21.5" P2214H Monitor (1920 x 1080) or current model

Computer Workstation Table
The computer workstation is a high quality ergonomic and movable operator workstation desk designed specifically for accommodating the computer and probe electronics equipment. Table dimensions are approximately 1200 mm (47.2") long by 680 mm (26.8") wide by 849 mm (33.5") high.

The PC-DMIS Online Programming Station Upgrade is required for PC-DMIS CAD and CAD++.

Upgrade from PC-DMIS PRO to PC-DMIS CAD and Autopath **$8,000**
PC-DMIS CAD lets customers create inspection programs and evaluate measurement results taking full advantage of their CAD models. The software provides the tools needed to work with CAD files ranging from simple 2D drawings through complex 3D solid models. Includes the PC-DMIS Autopath module – exciting new measurement software technology that automatically optimizes feature measurement and probe path creation. Includes PC-DMIS CAD trainining which is a five day class for one operator at a Hexagon Metrology Training Facility (travel expenses excluded).

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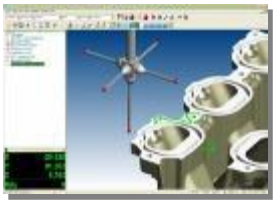
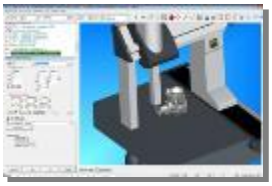
SOFTWARE UPGRADES AND OPTIONS INCLUDED IN PACKAGE



Upgrade from PC-DMIS PRO to PC-DMIS CAD++ and Autopath **$13,000**

PC-DMIS CAD++ includes all of the features included in PC-DMIS CAD plus full scanning support and sheet metal functions. Includes the PC-DMIS Autopath module – exciting new measurement software technology that automatically optimizes feature measurement and probe path creation. Includes PC-DMIS CAD++ training which is a nine day class for one operator at a Hexagon Metrology Training Facility (travel expenses excluded).



PC-DMIS Offline Software License

Use an offline software license to create part programs while the CMM is being used to measure parts. This special price is valid with the sale of a new CMM and includes the Autopath Bundle.

CAD++ Offline **$12,900**

IV. SPECIFICATIONS

WEIGHTS AND DIMENSIONS

Overall Dimensions with Touchscreen		
X	Y	Z
1105 mm	1556 mm	2020 mm
43.5 in	61.2 in	79.5 in

Overall Dimensions without Touchscreen		
X	Y	Z
833 mm	1325 mm	2020 mm
32.8 in	52.2 in	79.5 in

Work Capacity			
X (upper)	X (lower)	Y	Z
529 mm	608 mm	1100 mm	458 mm
20.8 in	24 in	43.3 in	18 in

Measuring Envelope		
X	Y	Z
355 mm	514 mm	353 mm
14 in	20.2 in	13.9 in

Weight	
Standard Configuration	Maximum Part
628 kg	160 kg
1386 lbs	350 lbs

PERFORMANCE SPECIFICATIONS

According to ISO 10360-2:2001:

MPE_E: 3.1 + 0.05 * ΔT + (3.0 + 0.2 * ΔT) * L / 1000
MPE_P: 3.2

According to ASME B89.4.1b-2001:

R: 2.0
A_V[L]: 6.4 + 0.3 * ΔT [300]

where,

- ΔT is the departure of ambient room temperature from 20˚C (68˚F) in ˚C;
- MPE_E is size measurement error in µm, where L is variable length in mm;
- MPE_P is probing error in µm;
- R is repeatability in µm;
- A_V [L] is volumetric accuracy in µm, where L is ball bar length in mm.

Accuracy performance specifications valid under the following thermal conditions:

- Ambient Temperature: 15-40°C (59-104°F);
- Maximum temporal variation: 2°C/h (3.6°F/h) and 10°C/d (18°F/d);
- Maximum spatial variation: 1°C/m (1.8°F/m) horizontal and vertical.

Probing configurations used for performance tests:

- TESASTAR, TESASTAR-i: 3 mm tip, 21 mm stylus length;
- TESASTAR-p: 4 mm tip diameter, 10 mm stylus length;
- TESASTAR-mp, TP20: standard force module, 4 mm tip diameter, 10 mm stylus length.

Installation site vibration must be less than 2µm maximum horizontal and vertical amplitude over 5-50Hz to ensure stated performance levels.

Dynamic Specifications	
Maximum 3D Velocity	433 mm/s
Maximum 3D Acceleration	1732 mm/s²

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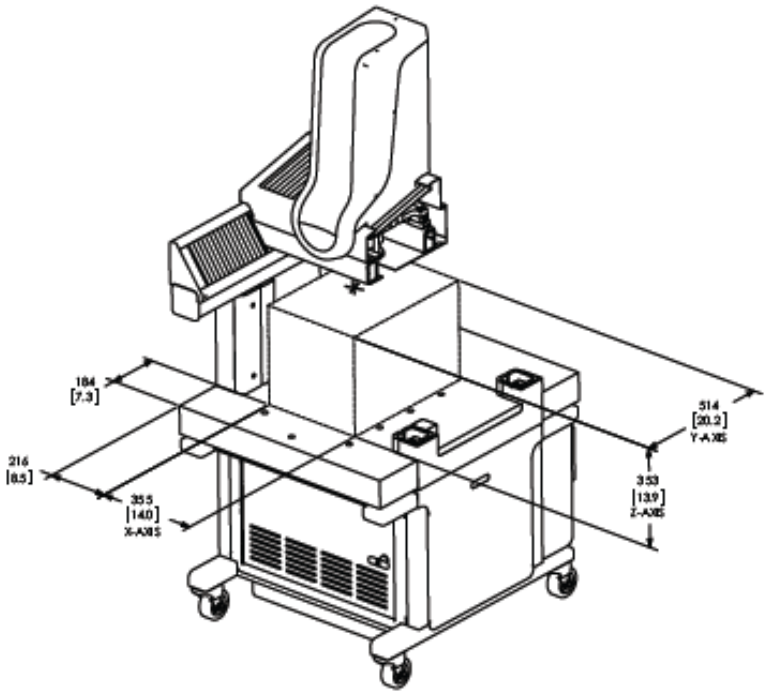
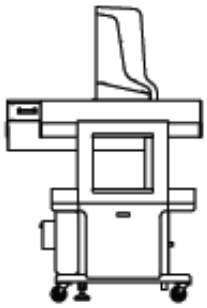
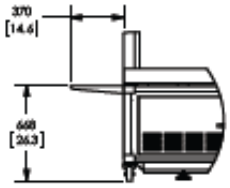
DIMENSIONAL DATA



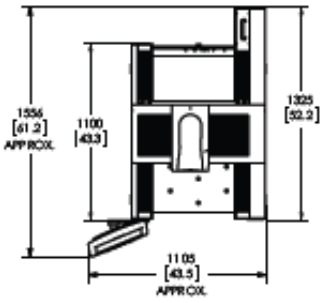
CUT-A-WAY FOR CLARITY



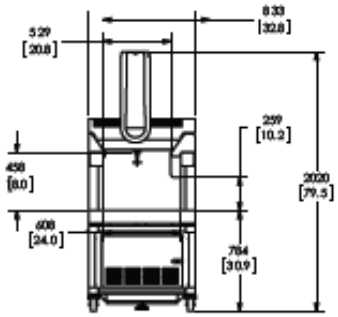
SIDE VIEW



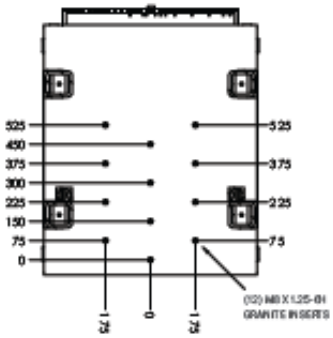
PRINTER SHELF OPTION



MONITOR DIMENSIONS
ARE APPROXIMATE AS MONITOR
ORIENTATION IS ADJUSTABLE.



MONITOR NOT SHOWN FOR CLARITY



X & Z AXIS NOT SHOWN FOR CLARITY

V. INSTALLATION RESPONSIBILITIES

Unless explicitly stated otherwise, this summary identifies the key milestones in the 4.5.4 SF installation process and identifies the appropriate responsible party. It is provided here in order to explain in more detail the scope of this proposal in order to avoid any possible misunderstandings and to facilitate a smooth and timely installation process.

DESCRIPTION	RESPONSIBILITY
Transportation	
From Hexagon Metrology factory to the customer facility	***Customer***
Handling at Destination	
Rigging, forklift/crane and labor	***Customer***
Place machine in permanent location	***Customer***[5]
Uncrate machine, prepare components for installation	***Customer***[6]
Utilities/Environmental/Site Requirements	
Conformance to environmental specifications	***Customer***
Compressed air supply per machine requirements	***Customer***
Electrical provision per machine requirements	***Customer***
Vibration evaluation of installation site	***Customer***
Completion and return of Site Preparation Checklist[6]	***Customer***
Installation	
Rigging, forklift/crane and labor	***Customer***
Machine installation and startup	***Hexagon Metrology***
Calibration and verification[7]	***Hexagon Metrology***

[5] *Customer should uncrate and move the CMM to the intended installation location at least 24 hours prior to arrival of the Hexagon Metrology service technician in order for the machine to reach ambient temperature. If the customer requires, Hexagon Metrology can provide this service for an additional fee (see quotation for details).*

[6] *By completing the Site Preparation Checklist the customer is verifying that the site has been prepared per the Site Preparation Manual and ready for installation of the CMM. I understand that I will be billed for wait time associated with an unprepared site once the Technician has arrived.*

[7] *A Hexagon Metrology service person will perform a certification either to ISO10360-2:2001 or ANSI B89.4.1 whichever is specified by the customer. If not specified, then ANSI B89 will be performed. If B89.4.1 certification is required, then the following procedure will be performed at the customer's site.*

- *Perform a repeatability test in accordance to ANSI B89.4.1 1997 paragraph 5.3.*
- *Perform a volumetric test using a Ball bar in accordance to ANSI B89. 1997 paragraph 5.5.2*

Linear Displacement verification can be purchased as an option.
If ISO 10360-2:2001 certification is required, then the following procedure will be performed at the customer's site.

- *Perform MPE_E Volumetric uncertainty according to ISO-10360-2:2001 section 5.*
- *Perform MPEp Probing uncertainty according to ISO-10360-2:2001 section 5.*